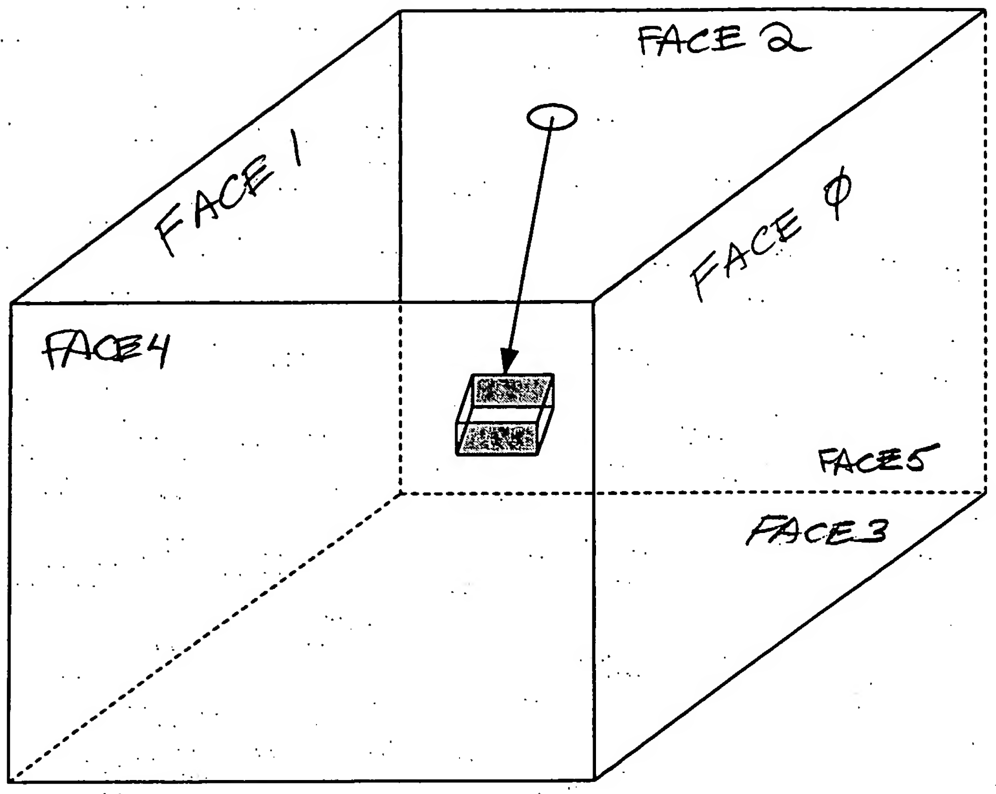


FIG. 1A

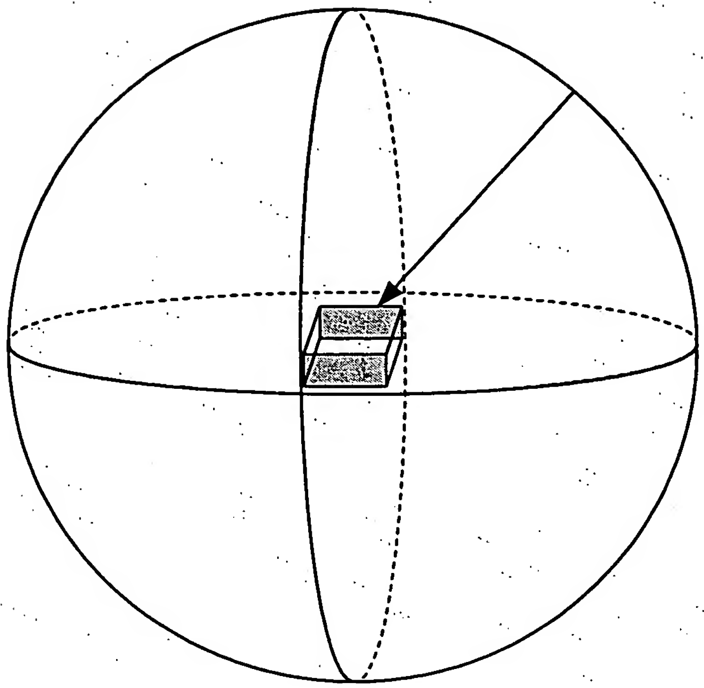
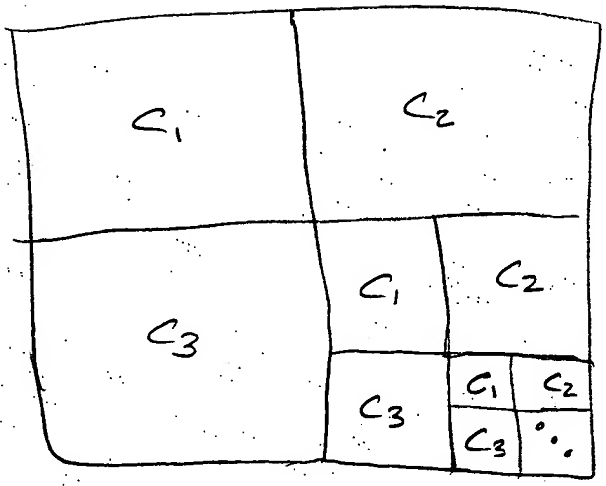


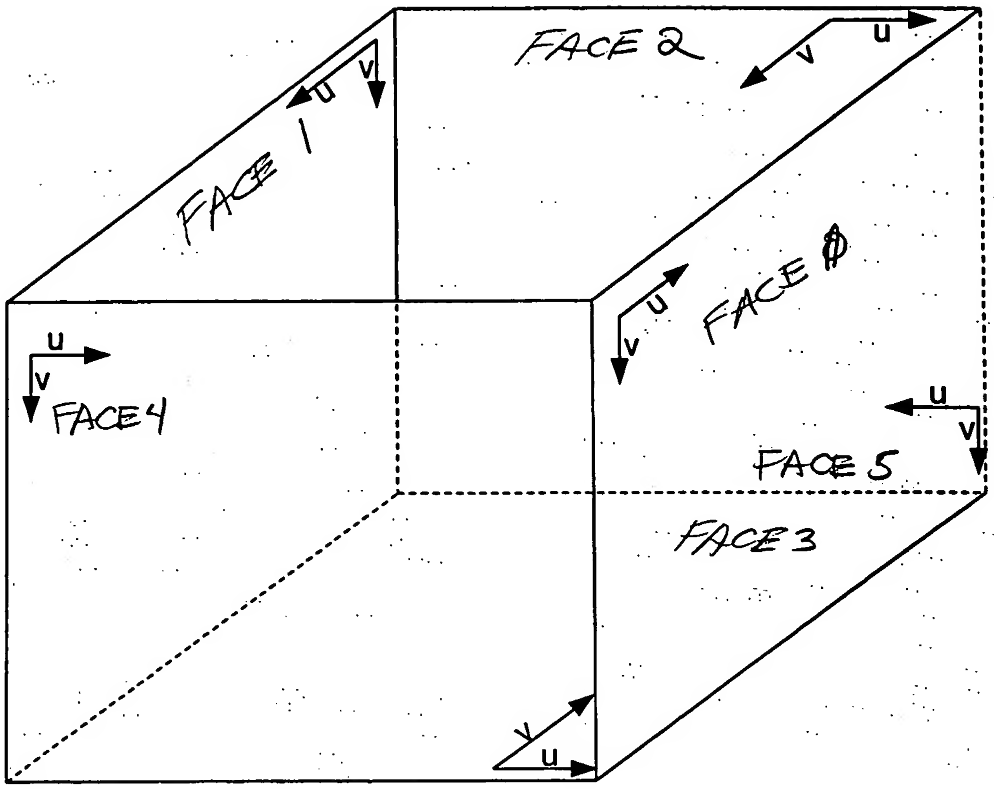
FIG. 1B



C_1 = texture 1
C_2 = texture 2
C_3 = texture 3

Mip Mapping

FIG. 2



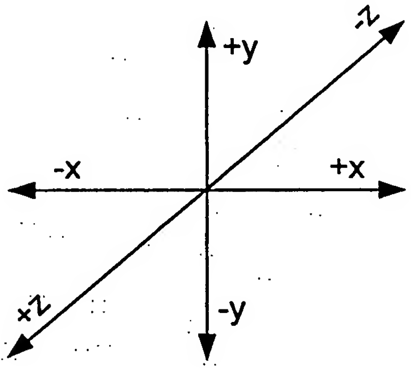


FIG. 3

```
#define FACE_POS_NX 0
#define FACE_NEG_NX 1
#define FACE_POS_NY 2
#define FACE_NEG_NY 3
#define FACE_POS_NZ 4
#define FACE_NEG_NZ 5

float absNx = fabs(Nx);
float absNy = fabs(Ny);
float absNz = fabs(Nz);

if (absNx > absNy && absNx > absNz) {//face major is X or -X
     if (Nx < 0) {
          fid = FACE_NEG_NX;
          U = Nz; V = -Ny; Major = -Nx;
     }
     else {
               fid = FACE_POS_NX;
               U = -Nz; V = -Ny; Major = Nx;
     }
}
else if (absNy > absNz) {//face major is Y or -Y
     if (Ny < 0) {
          fid = FACE_NEG_NY;
          U = Nx; V = -Nz; Major = -Ny;
     }
     else {
          fid = FACE_POS_NY;
          U = Nx; v = Nz; Major = Ny;
     }
}
else {//face major is Z or -Z
     if (Nz < 0) {
          fid = FACE_NEG_NZ;
          U = -Nx; V = -Ny; Major = -Nz;
     }
     else {
          fid = FACE_POS_NZ;
          U = Nx; V = -Ny; Major = Nz;
     }
}
```

FIG. 4

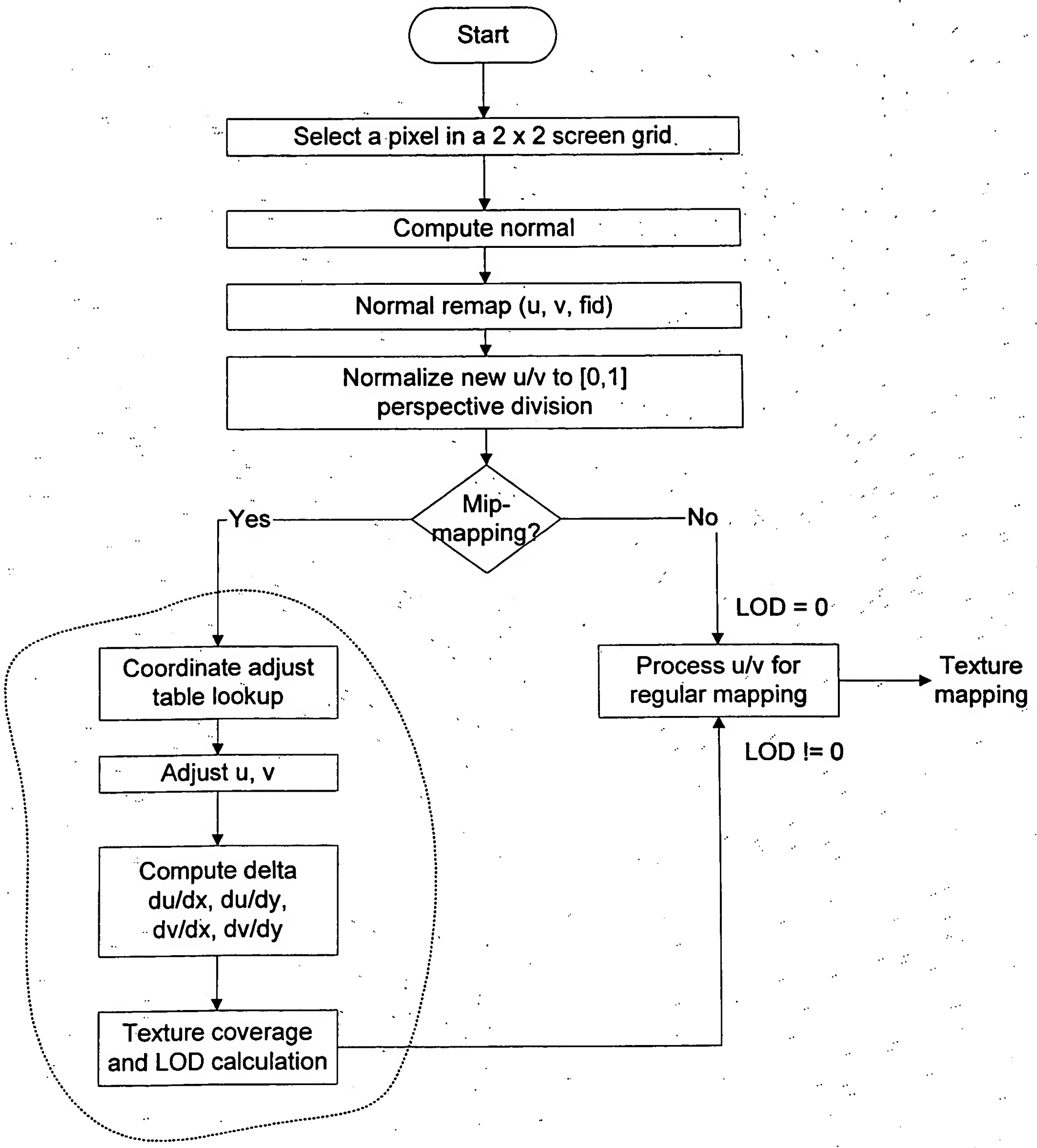

Start
Select a pixel in a 2 x 2 screen grid
Compute normal
Normal remap (u, v, fid)
Normalize new u/v to [0,1] perspective division
Mip-mapping?
Yes
No
LOD = 0
Coordinate adjust table lookup
Adjust u, v
Compute delta du/dx, du/dy, dv/dx, dv/dy
Texture coverage and LOD calculation
Process u/v for regular mapping
Texture mapping
LOD != 0

FIG. 5

		Bits 3:0				
		0000	1000	1011	1100	1111
Bits 5:4	00	X⇒X X⇒-X -X⇒X -X⇒-X Y⇒Y Y⇒-Y -Y⇒Y -Y⇒-Y Z⇒Z Z⇒-Z -Z⇒Z -Z⇒-Z	X⇒Z -X⇒-Z Z⇒-X -Z⇒X	X⇒-Y		X⇒Y
	01		-Y⇒Z Z⇒Y	-Y⇒-X	-Y⇒-Z -Z⇒-Y	-Y⇒X
	10		X⇒-Z -X⇒Z Z⇒X -Z⇒-X	-X⇒Y		-X⇒-Y
	11		Y⇒Z Z⇒-Y	Y⇒X	Y⇒-Z -Z⇒Y	Y⇒-X

5	4	3	2	1	0
0=add 1=sub	0=U 1=V	Need adding			Swap UV

0	0	No flip
0	1	Flip U
1	0	Flip both UV
1	1	Flip V

FIG. 6

```
uinte32 cube_adj_table [6][6] = {
     // 6 bit code for UV adjustment for x1 during x1-x0
     // operation. X1's face id and x0's face id are used to
     // index the table. x1 is either U or V.
     // bit[0]: swap UV;
     // bit[2:1]: 10=flip both UV, 00= no flip, 01=flip U,
     // 11=flip V;
     // bit[3]: need adding;
     // bit[5]: 0=add, 1=sub;
     // bit[4]: 0=U, 1=V;
     0x00, //   X    X
     0x00, //   X   -X
     0x0f, //   X    Y
     0x0b, //   X   -Y
     0x08, //   X    Z
     0x28, //   X   -Z

     0x00, //  -X    X
     0x00, //  -X   -X
     0x2b, //  -X    Y
     0x2f, //  -X   -Y
     0x28, //  -X    Z
     0x08, //  -X   -Z

     0x3b, //   Y    X
     0x3f, //   Y   -X
     0x00, //   Y    Y
     0x00, //   Y   -Y
     0x38, //   Y    Z
     0x3c, //   Y   -Z

     0x1f, //  -Y    X
     0x1b, //  -Y   -X
     0x00, //  -Y    Y
     0x00, //  -Y   -Y
     0x18, //  -Y    Z
     0x1c, //  -Y   -Z

     0x28, //   Z    X
     0x08, //   Z   -X
     0x18, //   Z    Y
     0x38, //   Z   -Y
     0x00, //   Z    Z
     0x00, //   Z   -Z

     0x08, //  -Z    X
     0x28, //  -Z   -X
     0x3c, //  -Z    Y
     0x1c, //  -Z   -Y
     0x00, //  -Z    Z
     0x00, //  -Z   -Z
};
```

FIG. 7A

```
uint8 code = cube_adj_table[ fid[1] [fid[0] ];
for (type = 0, 1) repeat { //type 0 is du/dx, type 1 is dv/dx
     bool swap_UV = (code&1);
     bool flip_UV = (( code >> 1&3)==2) ||
                    (( code >> 1&1)     &&
                    type == (code >> 2&1));
     bool add2_UV = !(code >> 5&1) &&
                     (code >> 3&1) &&
                     ((code >> 4&1) == type);
     bool sub2_UV = (code >> 5&1)  &&
                    (code >> 3&1)  &&
                    ((code >> 4&1) == type);

     if ((swap_UV && type==1) || (!swap_UV && type==0))
          ret = u;
     else
          ret = v;
     if ((flip_UV) {//add one because of u/v already adjusted to 0-1
          ret = 1.0 - ret;
     }
     if (add2_UV) {
          ret += 1.0;
     }
     else if (sub2_UV) {
          ret -= 1.0;
     }
}
}
```

FIG. 7B

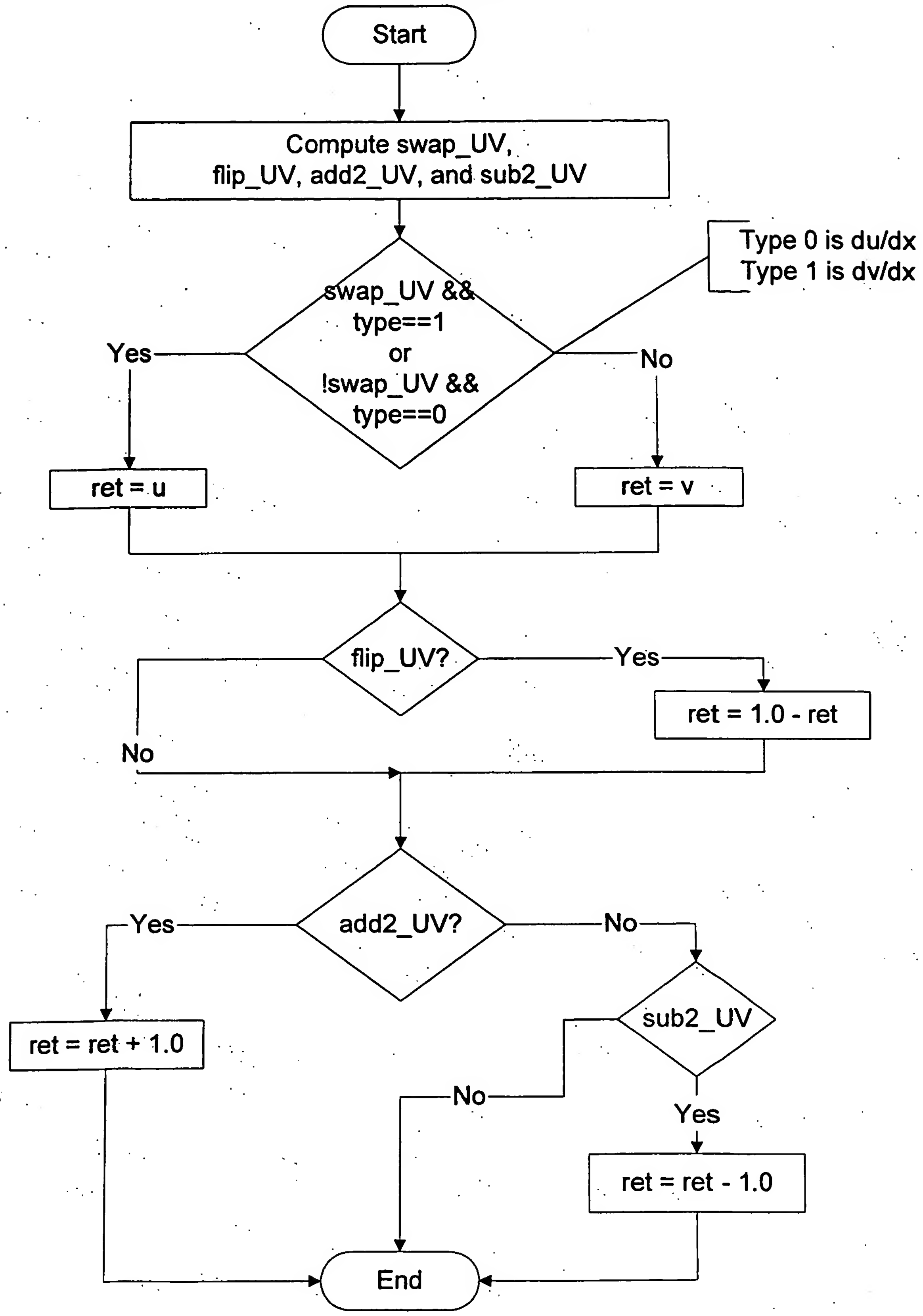

Start
Compute swap_UV, flip_UV, add2_UV, and sub2_UV
Type 0 is du/dx
Type 1 is dv/dx
swap_UV && type==1 or !swap_UV && type==0
Yes
No
ret = u
ret = v
flip_UV?
Yes
No
ret = 1.0 - ret
add2_UV?
Yes
No
ret = ret + 1.0
sub2_UV
No
Yes
ret = ret - 1.0
End

FIG. 8